

"The treatment of Insomnia in Fevers."

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"The treatment of Insomnia in Fevers."

This subject, in private practice, is one, in connection with the specific fevers, which only now and again calls for treatment, and might be thought unworthy of attention. But in hospital, it is one we have frequently to deal with. During sixteen months residence in the City of Glasgow Fever Hospital at Belvidere, the insomnia of fevers was a subject, which early attracted my attention, and interested me greatly. The comparison of the effect of hypnotics in fever cases - with their action in ordinary medical cases, which I had treated in the Town's Hospital, and in cases of insomnia in lunatics which often occurred in the Parochial Asylum, was a great source of interest to me. I was also greatly surprised at the difference of the effect of hypnotics in fevers, as compared with their action in ordinary medical and lunacy cases. Though the subject of this paper is the treatment of insomnia in fevers, yet my observations on hypnotics were chiefly made in enteric fever wards. As, however, I have, at times, made reference to insomnia in other fevers, I think it better to use a

a title, which will embrace all the specific fevers I have treated.

I think that the treatment of insomnia is bound up, more or less, with the subject of the treatment of hyperpyrexia. This, at first, may seem strange, but I think I will be able to show that they are connected at times, at least indirectly.

In the department of pharmacology, more advance has been made, in recent years, among the class of drugs known as hypnotics, than in almost any other group. Numerous experiments have been made with the newer drugs (I mean hypnotics); those, which have been found useful, have found a place in our Materia Medica, while others of doubtful utility have been tried, and, after a short time, have been condemned.

Physiology of Sleep:- I would now like for a little to look at the physiology of sleep, and afterwards try to point out, what I would call the pathology of sleeplessness, with special reference to the eruptive fevers. Randois and Stirling point out that in sleep, the mental processes are completely inactive, and that there is a diminished excitability, or

or activity of the nerve centres of the heart, respiration, and of those presiding over the gastro-intestinal functions. I have looked over the papers and experiments of many writers on the subjects of sleep, but no one seems to have arrived at a certainty, as to the exact causes of sleep. There seems to be no doubt but that many causes are at work. There is a reduction in the circulation of the brain, and there is also, an increased amount of tissue waste products in the brain substance. During waking, there is an active molecular change in the cerebral cells, which, during sleep, is almost suspended.

Even in waking moments, the motor centres cannot be all active, but in sleep, they are all more or less passive, and this is also true, so far as is consistent with life, of the centres in the medulla, which regulate respiration and the cardiac action. From reading much of the literature on sleep, I think that, broadly sleep may be said to be caused by (1) lowered vascularity of the brain substance, (2) Diminution of oxygen supplied to the brain, (3) Presence of increased tissue waste products in the brain. Granted that these three conditions are present during sleep, I do not think we can be sure that these are the

the only factors in the causation of sleep. Often in fevers a good sleep is the only thing we pray for at a crisis, and at such times, I hold that sleep is often the one factor between life and death, and is therefore a very valuable life preserver.

Insomnia tells us that the changes in the brain which are detailed above, have not taken place. Insomnia itself is not a disease but merely a symptom. It may be a symptom of some small trouble, which only requires a little treatment to set it right. In the other hand, it may be, so to speak, "a danger signal" of some serious disease. The causes of insomnia, taken by themselves, are very numerous, and in fevers, we have sleeplessness from a variety of causes - such as retention of urine, some lung mischief, constipation, typhoid, incipient peritonitis etc. But the kind of sleeplessness we are generally called on to deal with in fevers is that, not due to any complication, but to the febrile condition itself. Here I would not forget to mention that frequently, too, we have to deal with the sleeplessness of convalescence.

We may divide this febrile insomnia into two

two classes (1) Where the patient is sleepless from delirium, and (2) where the patient is quite sensible, but has a very high temperature.

Take for example an enteric fever case. In the second week of illness, when the temperature is high, and keeping about the same for several evenings, we find a patient wide awake on the night visit. He makes no specific complaint, but just the general one that he does not at all feel inclined to sleep. The morning report of this case probably shows a high temperature, and that the patient has been restless and sleepless during the night. In such cases we find a rapid, and sometimes full pulse. The pathology of the sleeplessness in such a case is, that there is a larger flow of blood to the brain than usual, and this blood contains the morbid products of the disease from which the patient suffers - in addition to an increased amount of tissue waste products. These factors are sufficient in such a case to account for the insomnia. In reference to the tissue waste products, the fluids of the brain, have in cases of insomnia, been tested after death, and found to be highly acid. Whether this has anything to do with lactic acid

acid, fermentation or not, I am unable to give any proof. If a fever patient has not slept for several evenings, then in the interest of the patient's strength, and chances of recovery, we must take some steps to procure him sleep.

Now I do not advocate the frequent use of hypnotics in fevers, if their use can be avoided. The habit is acquired very easily of ordering them, and I think that harm may be done by the abuse of hypnotics. I think that in dealing with insomnia in febrile cases, one should lay down for oneself some rules to go by. I always in cases of insomnia try (1) to find if there is not some cause for it other than the temperature. (2) Then if the patient has been sleeping fairly well beforehand, and is strong, I wait till the second night to see if the insomnia continues. Should it be the case on the second or third evening, then we must take some means to procure the patient sleep. I think that the use of hypnotics should always be carefully considered, and their actions closely watched. One may have a great many cases of fever passing through his hands, and yet not have suitable cases for administering hypnotics, so that it requires observation over a long period of time, and selection of cases before an opinion can be

be formed on the value or best method of use of the various sedative and hypnotic drugs.

For the purposes of procuring sleep, we use the group of drugs classed under the heading of "hypnotics". Their action as a group is, broadly, that they lessen the functional activity of the brain, and in this way induce sleep. Small doses of them cause inco-ordination, as Opium, others as, Bromide of Potassium, merely lessen the nerve activity.

Experience has taught me that, in many cases, a combination of hypnotics acts much better, than when these drugs are used separately, even in larger doses.

Dose:- It is often difficult to know what amount of a drug to give, but we find that we get better results where a tolerably large dose is given. Small doses, in many cases, often tend to make the patient more wakeful and restless, as is seen when small doses of chloral are given.

What we want, in fevers, is a drug, which will produce sleep, without depressing the heart to any extent, and which will not cause cerebral disturbance on waking.

In using such drugs, we use what are called sedatives and hypnotics, but in my opinion these

8.
these two classes run very much into one another and it is difficult to tell where one class leaves off, and the other begins.

In trying to combat insomnia, I have tried several hypnotics with patients in my wards, and the first drug I would like to make some remarks on is sulphonal.

Sulphonal:- like paraldehyde belongs to the fatty group of chemical compounds, and from this group, most of the newer hypnotics have been obtained.

Its solubility in water seems to be from four to five ^{parts} hundred of distilled water to one part of sulphonal.

In Rock Katrine water the solubility is about one part of sulphonal to 450 parts of water.

The addition of finely powdered chloride of sodium makes it dissolve in less than half the above volume of water (i.e. the solubility becomes about 1 in 200). By experiment, it has been found that this is its solubility in the gastric juice.

From my own experience, I find that pounding sulphonal in a mortar, makes it more soluble than one in four hundred and fifty, and that after this treatment, its action becomes hastened.

hastened, often being apparent in an hour's time. This, however, is a most important point, as the delayed action of sulphonal has time and again caused me disappointment.

Its action is accelerated, and I think made more certain by its administration being followed in an hour or so by a dessertspoonful of Whiskey or Brandy or by half an ounce of Champagne. It has been claimed for sulphonal that it produces a natural sleep, and causes no after bad effects; but cases are quoted where it caused cyanosis after a twenty grain dose; and the British Medical Journal, about two years ago, published a case, where a child had vomiting and irregularity of the pulse after its use in small doses.

Later, a case is quoted where a melancholic patient was treated by Bromides, then by sulphonal. After the use of sulphonal, a diminished quantity of urine was noted, but free from albumen and blood. Haemoglobinuria developed later, then albuminuria supervened. Under the microscope, the urine showed leucocytes and casts. Later the patient had retention of urine, and then died.

From these notes of cases, it would appear,

appear that Sulphonal has not altogether been free from ill effects, but in my experience, I have not seen any such effects, as those quoted above.

My experience of Sulphonal as a hypnotic is very disappointing when given to fever patients suffering from insomnia.

Given even in fairly large doses, its action, if at all apparent has not generally become so for a number of hours after the drug had been administered.

This, I think, may be explained by its great insolubility in the gastric juice.

Suppose a fever patient is ordered this drug about nine or ten P.M., it has time and again been my experience on the morning visit (10 A.M. till mid-day) that the patient has not slept any during the night, but has perhaps slept since 7 or 8 A.M.

In posological tables, the dose of Sulphonal is laid down at from ten to thirty-five grains.

I don't think I can point to any of my enteric cases, in which I used Sulphonal for insomnia, where the drug can be said to

22nd Sulphonal gr^{xxx} rpt^d
in four hours.

23rd Sulphonal gr^{xxx}.

25th Jacket Pouches stopped.
Chest rubbed with Turpentine
and acetic acid liniment.
Tepid water and acetic acid
sponging every three hours.
Urine albuminous. It has a
suspicious reaction with
Th. Guaiac and Ozonic Ether,
but patient is having
5 grains Iodide of Potass
thrice daily.

27th "Cheyne Stokes"
respirations, Hiccups,
Sub-sultus tendens.

[illegible]

to, have acted efficiently.

This chart, which I show, I would draw attention to as that illustrative of a most interesting case, which, unfortunately, proved fatal.

B — H — aet. 18 years. Admitted 22nd Sept. 1890 to Ward III East (Enteric Ward) Bevidere Hospital. The patient was one of a group of curious cases, where the diagnosis lay between enteric and typhus fevers. All these cases had more or less of a pulmonary complication; in some of them, in fact, the lung condition was the main feature of the case.

Though I have never seen such cases before nor have I seen any since, I have a strong suspicion that they may have been cases of "infective or epidemic pneumonia".

If such be the case, one cannot be surprised at the great delirium and sleeplessness, which were marked features of the cases.

Looking at the chart, one sees that the patient had on the evening of the twenty-second gr. xx. of Sulphonal followed in four hours by other twenty grains, and that the

the morning report showed that patient had slept none. On the evening of the twenty-third, patient had grxxx of sulphonal, and did not sleep during the night, but was drowsy during the next day. Then still following this chart, we see that patient had sulphonal grxxx on the evening of the 25th, followed by grxx in three hours, and that the morning report is "did not sleep." However on the 26th, the Charge Nurse notes in her daily report, presented at the evening visit, "B - H - slept very well to-day."

Again, during the autumn of 1890, a case of "Delirium Tremens" with erysipelas of the face and head was admitted into Ward XV, Belvidere. I ordered him two fifteen grain chloral suppositories, but these had no effect. Later in the day, he was seen by Dr. Allan in consultation. As we were afraid of his heart giving out, Dr. Allan suggested that Sulphonal might be tried. The patient accordingly had a grxxx powder, which was repeated in two hours without having the least effect.

Many other cases I could quote where

where, sulphonal has failed me, but these serve as good examples.

Now one thing, which early struck me, as regards sulphonal, was its different action in cases of insomnia due to cardiac disease, functional trouble and fevers.

In hospital, where patients with cardiac valvular disease were sleepless, I have had satisfactory results from sulphonal, given a few hours before the sleep was wanted, and have seen patients, otherwise sleepless, have a good five to seven hours sleep, after the use of this drug.

In patients who were sleepless from mere nervousness, I have found the drug also do well.

I would only use sulphonal in fever cases, in which I think it is comparatively useless, where I was afraid to give a depressant as Opium or Chloral.

In such cases, the drug is best given early in the afternoon or evening, and repeated frequently. Also the drug should be well rubbed in a mortar before use, and its administration followed by a little alcohol.

The bruising and spirit help its solution, in the stomach, and quicken its action.

I have found it entirely useless, where there is insomnia from pain.

For sulphonal, it may be said that it perhaps may cause sleep - which will be like a natural one; and that, if it causes sleep, in all probability, it will not cause any unpleasant after effects. Also it may be given in cardiac and kidney affections in fevers, where one would avoid Opium. Against sulphonal, is its uncertain action, its marked insolubility, and that it is rather an expensive drug.

In the "Annals of Universal Medical Sciences" by Sayers, a great many writers advocate the use of Sulphonal in insanity.

Several others of these writers seem to have had some of my experiences with Sulphonal.

One writer - J. G. Crozier Griffith finds the chief disadvantages are (1) Its hypnotic action usually develops slowly. (2) This action is very liable to be prolonged throughout a greater or less part of the following day.

" (3) It is difficult to determine the dose which may "
 " be given with effect and with comfort in each "
 " case, and this dose may vary at different "
 " times in the same case. (4) The drug is liable "
 " to produce unpleasant secondary effects, which "
 " may even replace the primary hypnotic action, "
 " chief among these are mental excitement, nausea, "
 " vomiting, dizziness, headache, languor, exhaustion, "
 " depression and a staggering gait. These "
 " symptoms may appear after a large or after "
 " quite small doses. (5) It often fails to excite "
 " any hypnotic action, either in any dose whatever, "
 " or in any amount which can be given with "
 " comfort to the patient "

My own experience quite accords with that of Dr. Griffiths, except, happily, as to the unpleasant after effects of sulphonal, which I have not yet seen.

In the "American Practitioner and News" for July, 20th, 1880, there is an article on "Typhoid Fever with furious delirium". In this case thirty grains of sulphonal were given every two hours, till 120 grains were administered and there was no appreciable effect.

Opium:- I would like to say something on the use of opium in its several forms as a hypnotic in fevers. To use the old phrase - "Opium is our sheet anchor in pain." But apart from using it to overcome pain, - in some of its forms it is useful and pleasant to administer for the purposes of procuring sleep.

In the early stages of enteric fever, Chlorodyne has in several of my cases acted well, just at the time when we so frequently find the patient complaining of inability to sleep.

Chlorodyne has a pleasant taste, and, though having a great many ingredients, yet opium in the shape of Morphia is its active ingredient.

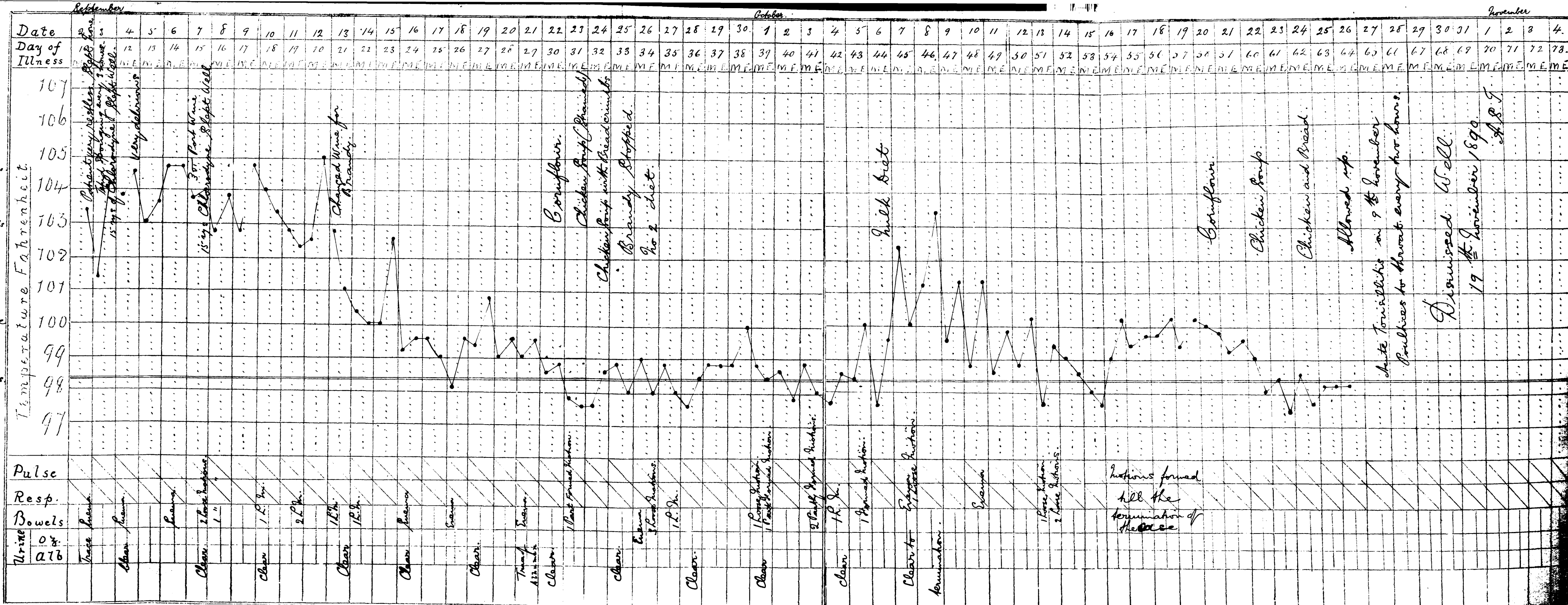
ominims given in water generally give the patient a good sleep, without causing any unpleasant after effect. This form of opium (Chlorodyne) has answered admirably in the early delirium of enteric, where one is not afraid to give opium.

Illustrative of the cases in which I have used Chlorodyne, I show a chart.

Wrs In —. Ward v East (Enteric Ward) Bedvidere.

Patient was one of the group of cases I have

The rose spot seen on
 admission. Bronchitis.
 4th Sept. Maculae on hands
 6th Pustules to Chest
 Mustard & Linseed
 (4 parts to 1)
 Expectorant mixture.
 7th Suspicious spots on
 abdomen. Pronounced rose
 spots by Dr. Allan.
 15th Stopped expectorant
 mixture. Ordered Rher
 Sulphuric & Tk. Digitalis.



have referred to already, when speaking of sulphonal.

This patient was a sister to B. M. - whose chart is numbered one. Chlorodyne produced a quiet sleep on several occasions, and sleeplessness was a marked symptom in her case.

When there is pain and sleeplessness, then opium should be given boldly - as long as the patient is not delirious. Give a half to one grain of the crude opium. In cases of sickness, I think the crude form is apt to increase the sickness and to cause vomiting, if the dose is at all large. When there is sickness with pain, then, when I elect to use opium, I order the *Liquor Opii Sedativus* (Battley's Solution.)

This solution is of uniform strength, and its dose is half that of the British Pharmacopoea tincture. The value of *Liq. Opii Sedat.* in cases of insomnia due to sickness, vomiting and pain, was impressed on my mind in the case of a Mr. Wansker, a Jewess. The patient had severe vomiting and great tympanitis - and we failed to give any relief to the sickness and insomnia, till this form of opium was tried.

Twenty minims doses in her case produced sleeps on several occasions, varying in length from two to seven hours. The patient took the drug easily, and her expression was that "she had the most delightful sleep she had ever had in her life" after the use of Opium in this form.

Now using Opium freely in enteric, I would venture to think that the B. P. dose of Opium is rather small, while that of Morphine, if anything, is rather large.

Opium in the form of Morphine acts quicker than the crude drug, and this formula answers admirably for hypodermic injection.

Rx. Morph. Acetat. gr $\frac{1}{6}$.
 Atrop. Sulph. gr $\frac{1}{96}$.
 Sod. Chlorid. gr $\frac{1}{4}$.
 Aq. Destill. η x. ~~8~~

Sig:- The injection.

Here the acetate has the advantage over the muriate in being soluble in a quarter the volume of water. The dose of Atropine may seem to be to the large side, as gr $\frac{1}{120}$ ^{is}, is usually given, but in making up

up, a two dram solution, which is a very convenient quantity to have dispensed, at a time, an $\frac{1}{8}$ th of a grain of Atropine will be exactly a $\frac{1}{96}$ th of a grain of the sulphate in each ten minims of the solution.

Hypodermic solutions made up with camphor water as recommended in the earlier days of hypodermic medication, become very muddy on standing, and develop, on the top, a fungus which is like fine cotton fibre. Instead of Camphor water if distilled water be used, as directed in the B. P., the solution remains clear.

The B. P. solution of the acetate is now in (distilled) water. The addition of chloride of sodium seems to preserve the solution from undergoing any decomposition. Salt solutions are rapidly absorbed into the tissues, but I cannot say whether the addition of so small a quantity as a $\frac{1}{4}$ grain of the Sodium Chloride, will have any appreciable effect in the absorption of the ten minims of the solution hypodermically.

I have always used this combination of the acetate of Morphia and the sulphate of Atropia in the doses indicated, and have never had any

any, cause to change the formula.

When a patient is kept awake from diarrhoea and pain in the lower part of the large intestine with tenesmus, the Suppos. Plumbi Com. of the B. P. has time and again in my enteric cases checked the diarrhoea, relieved the pain and tenesmus, and allowed the patient to have a peaceful sleep. Each suppository contains a grain of Opium. Much of this cannot be absorbed (probably about a fifth) but it gives a sleep by removing the cause of the insomnia. The suppositories must be fresh to be of much use, and the readiest way to test them is to see if they begin to melt with the heat of the hand, by holding them in the palm for a minute or so. If they begin to melt with the heat of the hand, they will probably act well; but if they are hard, they should not be used, as they will probably be passed much in the same condition as they were in when inserted into the bowel. Pil. Plumbi & Opio contains one grain of opium, and given for the same purpose as the suppository, causes a sound sleep.

Syrup of Codeia - which is unofficial - I have

have, found to act as a good hypnotic. It is a clear syrup with rather a sharp taste. Its maximum dose is one dram. Given with Tk. Cardam. Co. it tastes not unpleasantly. In one of my enteric wards, half dram doses were given to a girl, sixteen years of age, and it answered admirably in her case, where there was insomnia from an irritating cough.

In dealing with insomnia in fevers, especially in typhus and enteric, there are several symptoms in cases, which serve as "danger signals" to the use of Opium.

Broadly, Opium is contraindicated in the later stages of enteric and typhus, as we often find some lung complication, such as bronchitis or hypostatic congestion in severe or prolonged cases about this time. In enteric fever, especially in the later stages, there is often albuminuria, which would further make us cautious of employing Opium or Morphia. In speaking of albuminuria in the later stages of enteric, my opinion is that it is generally only a "congestive" albuminuria. By this I mean that there is not an actual nephritis, but only a febrile albuminuria, or albuminuria due to passive

passive, congestion, from a weakened circulation.

On many occasions, I have examined samples of such albuminous urines, and there is never, as a rule, any indication of an actual nephritis, and further, on the fever falling, and on the patient convalescing satisfactorily, this albuminuria entirely disappears, especially if chalybeate tonics be used.

If Opium is used in cases where there are kidney and lung complications, it will have the desired hypnotic effect, but then there is the danger of locking up the secretions, and causing serious risk to the patient, not from fever, but from stasis of the blood, and increased retention of tissue waste products.

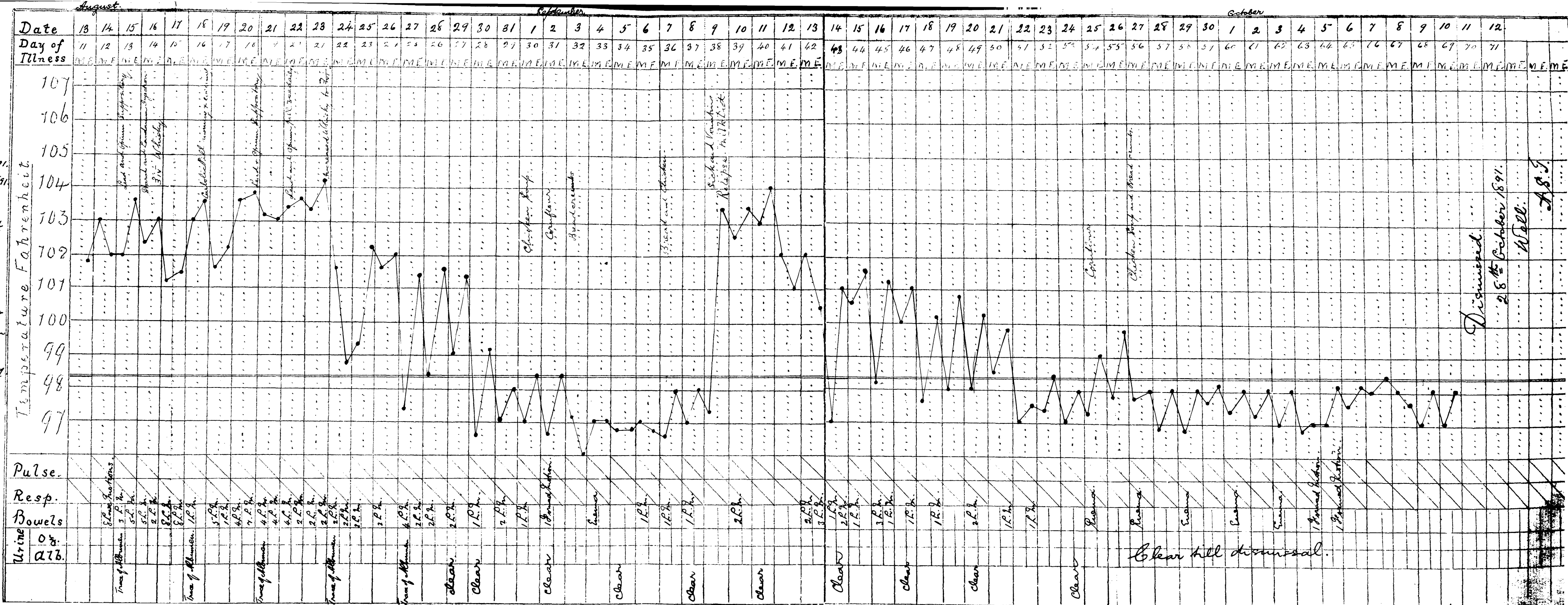
Dr. Graves of Dublin was very strong on the combination of Opium and Antimony in typhus, but I would sound a warning note, as to the use of antimony in any fever. It has been said that tartar emetic should be pushed in cases where there is excitement in typhus from a greatly excited circulatory condition. There are often cases of great excitement of the cardiac action in typhus, but I think that the same calming action as that of Opium and

W^{rs} Denny
aet 21 years.
Admitted 11th Aug 1891.
Dismissed 28th Oct. 1891
Well.

Case of enteric with
one relapse.
Prolonged diarrhoea.

Treatment:-

1. Lead and Opium
 2. Starch and Opium
 3. Pil. Acid. Carb.
- morning and evening



and, Antimony is got by the use of chloral hydrate, and that by using chloral we do not expose our patient to such a risk of cardiac failure, as we do when using Antimony.

I think that the teaching of the "Glasgow School" is right namely that Antimony is too much of a depressant to be used, except with extreme caution.

Comparing Opium and Morphia, the later is the more convenient form in which to give opium, and it interferes less with the secretions than the crude drug, and has not such marked after, unpleasant effects. Morphia being the active principle of Opium, it is more rapid in its action as a hypnotic.

Illustrative of the cases in which Lead and Opium suppositories, and pills were used, I show a chart of Mrs Benny, a case in which there was profuse diarrhoea. This was a typical case of bad enteric with persistent sleeplessness, due to diarrhoea and high temperature. Opium was used with good effects as regards the sleeplessness, and somewhat controlled the diarrhoea. The patient was then put on carbolic acid pills twice daily, and then the Opium was stopped for a time. The motions in this case had been very foetid, and "chopped vegetable" in character,

showing that the milk was passing through the alimentary canal being only partially digested.

Only on two occasions after the above treatment was commenced, had opium to be employed, when there were uncontrollable spurts of diarrhoea, and it was not considered advisable to increase the antiseptic, as the patient had a tendency to sickness. While on this subject, though it is rather away from the direct treatment of ischaemia, I would draw attention to this chart, as being pretty much the ending of some of my cases treated with carbolic acid. The temperature in several cases took a sudden drop, and the case ended more by crisis than by lysis. The carbolic acid, in my opinion, was valuable in destroying the focus of the infection, more valuable in acting as an antiseptic astringent, and thus controlling diarrhoea - and most valuable as in one or two of my cases seeming to act by pulling down the temperature by crisis.

Paraldehyde:- The next drug I wish to speak of is Paraldehyde. It is an oily looking fluid with little or no colour, and with a characteristic and unpleasant odour. It is supposed to have an action rather like chloral - but it seems in my

my, experience rather to increase the strength of the cardiac action, than to depress it. I have used the drug several times in enteric wards, and have usually had good results from it. According to the introducer of the drug, it has a diuretic action.

The last time I used the drug was in a severe case of enteric - a woman of about 45 years of age. In this case it had little effect. The patient was very sleepless and delirious, and in the earlier part of her illness, the insomnia had been partly overcome by Chlorodyne. Later, owing to her lung condition, which was one of hypostatic congestion, I ordered paraldehyde, but, as I have said with little effect - the patient dying with hyperpyrexia and seeming oedema of the lung. I was first lead to use Paraldehyde from having seen it used, and used it in my own practice with marked success, especially in cases of dementia. Though the drug has an unpleasant taste, I have never found any difficulty in getting patients to take it. As regards the dose, for an adult forty minims are not too much, and this amount may be repeated in an hour, if required, without any fear.

The formula I generally use is :-

R \bar{f} . Paraldehyde 4 oz.

Ept. Chlorof. 2 oz.

Syr. Aurant. 3 i.

Pulv. Tragac. Co. gr v.

Aquam ad 3 \bar{f} s \bar{m} . The Draught.

When mixed with water alone, Paraldehyde looks like oil on the top, and very little seems to dissolve. One dram dissolves in about seven drams of water. Mixed with Syrup of Orange and Compound Tragacanth powder, it forms a kind of emulsion. To a certain extent, the taste is masked, if the drug is given with Ext. Glycyrrh. Lig. I have used it in this combination, and think it helps us to get rid of the bad taste to a certain extent. Given in this combination, the mixture has much the same appearance as ordinary iron mixture. When Paraldehyde is given in this way, I notice that the odour is not so bad from the breath. Whiskey, I have also found to act as a good vehicle for the drug. Dr. Clouston of Morning-side Asylum refers to Paraldehyde in his "Mental Diseases" as being, in his opinion, the drug which produces sleep more like natural sleep, than any other, which he has known or tried. In his practice, he has given two drams

draws, at once, and found no ill effect from this dose. If it has the diuretic influence, which is claimed for it, then a large amount of it will probably be eliminated from the kidneys. The cases in which I have used Paraldehyde have not been having it for any length of time, so that I cannot say that there was any increased diuresis noticed. I have never seen the haemoglobinaemia, which is said to be a possible result of the use of the drug in large doses. I am sure, however, that the drug is, to a great extent, eliminated by the lungs, as I have noticed the peculiar "mousy" odour of the breath of patients, for several days after Paraldehyde had been employed.

A case in which the drug proved unsuccessful was that of a girl thirteen years of age. She was an enteric patient, and from the commencement of her illness, she complained of great pain in the back of the neck. Looking at her case from the classification of enteric fever by Trousseau, I put her case down as one of the class of the "cerebro-spinal" form. In this case, there was marked spinal tenderness, and a great deal of nervous disturbance. This kind of case seemed to answer pretty closely to the

the description of Trousseau's cerebro-spinal group. This was the most persistent case of insomnia that I have ever met with in my experience of fevers.

She was tried with (1) Nothing but mild restraint in the form of a strapping sheet (2) Bromidia. (3) Paraldehyde (4) With Bromide of Potass. Paraldehyde had little effect, Bromide of Potass none at all. This was a case in which hypnotics seemed to have no effect. With the exception of the two cases which I have quoted, I have found Paraldehyde to act successfully.

The last case of insomnia in which I used it, was in that of an enteric case complicated by pneumonia. She had hyperpyrexia, and was very delirious, and insisted constantly on getting out of bed. She slept for about an hour after a forty minims dose of Paraldehyde, and did not give any trouble after she awoke - the sedative action of the drug still seeming to continue. If I had the choice of Sulphonal or Paraldehyde, I would choose the latter - even though it has a bad taste - on account of its more certain and rapid action. In febrile cases with very irritable hearts the special value of Paraldehyde is manifested, especially, if there be any valvular disease, followed by dilatation.

Chloral :- is the hypnotic which has stood the test of time in the treatment of insomnia in fevers, and will I think be the drug to which we will still pin our faith in ordinary cases of insomnia, especially in typhus, and also, though to a less extent, in the early stages of enteric. Sleeplessness in typhus is one of the great dangers to be feared, on account of its increasing the already great weakness, and a good sleep at the critical period of typhus - 12th to the 18th day - may bring the balance down on the side of life, whereas death would be the inevitable result, were sleep wanting. The great secret of success, in using chloral, is the mode in which it is administered, and the dose given.

In cases of insomnia in typhus and, scarlet fevers, and in erysipelas, I have had capital results from the use of chloral. In the form of the Pyrup, 10 grains to the 3i, it acts splendidly in children. I can point to many cases of bad, scarlet - with severe rashes and bad throat complications - where chloral has often acted with great effect. But I think where the great value of chloral is best demonstrated is in cases of insomnia in typhus fever. The best way to give chloral is to give it boldly at first. In an adult give about twenty, or thirty grains, and

and, repeat the dose in an hour and a half if the patient does not sleep. If smaller doses are given, as a rule in fever cases and especially in typhus, it only heightens the delirium, and makes the patient extremely restless and excited. This I have seen on several occasions, when I first had charge of a typhus ward, and gave only ten and fifteen grain doses of Chloral at a time. The reason for repeating the dose soon, if the first has no effect, is that Chloral is absorbed very quickly into the system - so that from one to two hours is ample time for it to show its physiological effect. In the fierce delirium of typhus - when the heart is strong - the lungs clear, and the pulse full and bounding - then a small dose of Opium combined with the chloral just seems to act like a charm in quieting the patient, and giving him a four to eight hours sleep. If the blood aeration is at all defective, I would warn against using such a combination as Opium and Chloral. Chloral in the form of suppositories, I have used many times in scarlet fever, measles and whooping-cough with marked benefit. The great disadvantage in using the suppositories is, that they are worthless unless they are fresh. The chloral seems to become changed, when the suppositories are old, and

the, mass becomes very hard. If old suppositories be used, they are just passed in much the same condition as they were when inserted into the bowel. The hypodermic injection of chloral, I have not used in fevers, simply on account of the local irritation which it sets up - and the tendency to suppuration. Chloral is a capital agent to use in fever patients who are greatly troubled with mental apprehension as to the termination of their illness.

This has been demonstrated to me in cases - especially I remember one of a nurse, who was suffering from diphtheria, and she became extremely alarmed about her condition when paralysis of the palate came on. She became quite hysterical and only after a good dose of chloral did she become quiet, and go to sleep.

Dr. Hargraves points out that the cause of the drug causing excitement at times is due to its impure quality. I do not think I could lay the blame on the impurity of the drug in the cases in which it failed, but in the smallness of the doses given, and the too long interval in repeating the dose. The drug seems to act by depressing the heart's action, and so causing an anaemia of the brain. The exciting effect of small doses is very well seen in delirious cases of erysipelas, whether the drug is given by the mouth or by suppository.

Frequently, I have seen the rash caused by Chloral and at times it has been so like Measles, that, when there was an accompanying febrile temperature, I have had to isolate cases for observation.

Generally when using Chloral, I combine it with Bromide of Potass. "Bromide" seems to act on the brain by causing an anaemia, but does not have the depressing influence on the heart that Chloral has. If the combination is being used for any length of time, I add a few minims of Lignor Arsenicalis, as this seems to prevent any skin eruption.

Bromide of Potass, I have rarely used by itself, except where I was afraid to combine it with Chloral. I have used it, with benefit, in the later stages of typhus, where there was some deficient aeration of the blood, contra-indicating the use of any depressant, such as Chloral or Opium. In one case of enteric, Bromide signally failed. The lungs were affected, and I was afraid to use it in combination with Chloral. The Bromide was given in thirty grain doses with no effect, though it was frequently repeated. Perhaps it failed because it was given late in the delirium, when Bromides seem to have less effect than

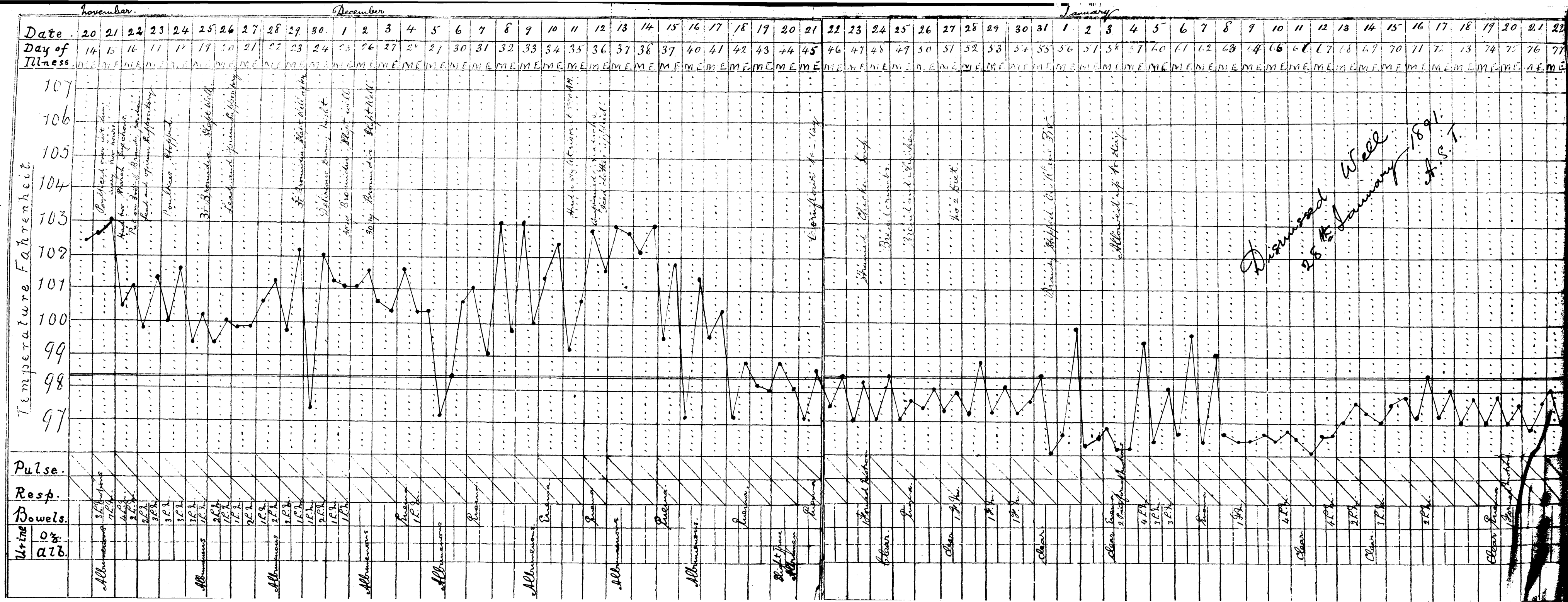
than, when given in the earlier period of delirium, or that the dose was not large enough. The latter I think could not be the reason, as the patient was only fifteen years of age, and ninety grains were given inside twelve hours.

The combination of Chloral and Bromide of Potass which I have used most frequently in Belvidere Hospital is "Bromidia". It is a proprietary article, and as a rule, I make it a matter of conscience not to prescribe medicines, whose exact composition may not be altogether known. Another objection is that it is rather an expensive drug. These objections, notwithstanding, I have had the good fortune to have had great success in using this combination known as "Bromidia". As far as we know, it consists of 15 grains of Chloral Hydrate 15 grains of Bromide of Potass and an $\frac{1}{8}$ th of a grain each of Extracts of Cannabis Indica and Hyoscyamus in a fluid dram. In patients with well developed nervous systems, Lauder Brunton advocates the combination of Opium with Chloral Hydrate and Bromide of Potass. In place of Opium in this combination (Bromidia,) we have Hyoscyamus, the sedative action of which is not unlike that of Opium, though its action on the

the heart approaches more to that of Atropia. Of course the dose of Hyoscyamus is very small in a dram of "Bromidia", but then it is used in conjunction with other hypnotics. Cannabis Indica is recommended as a hypnotic by Brunton, especially in combination with the Bromides. Cannabis Indica has not the after unpleasant effect of Opium as a rule, though I have on record the case of a patient who absolutely declined to take "Bromidia" again on account of the horrible feelings she had while sleeping under its effects, and the further depression of spirits for some time after its use. Though other hypnotics had been used in her case, it was only after a trial of "Bromidia" that such feelings were experienced, and I was strongly inclined to lay the blame on the Cannabis Indica in the combination. Now in "Bromidia", we have pretty much the combination recommended by Brunton, without having any ingredients which will - as a rule - have the unpleasant after effects of Opium. I have used the combination a great many times, and have never yet seen it cause the excitement, which is sometimes seen when simple combinations of Chloral Hydrate and Bromide of Potass are used.

W²⁵ M^c Intosh.
aged 21 years.
Admitted to
Ward V East
20th November 1890.

Prolonged Enteric.
Lung Complication.
Pleurisy of Left Side.
Insomnia treated
with Bromidia.
Dismissed. Well.
28th January, 1891.
A. S. T.



The "Chloral" or "Bromide" rash has not been seen in any of the cases in which I have used "Bromidia", although during the winter 1890-91, my colleague in Belvidere, Dr. David Roxburgh showed a case - that of a patient with enteric fever, who had developed a well marked, rather raised, measlesy eruption after the administration of "Bromidia" on one or two evenings. The dose is put down at $\mathfrak{z}\text{ss}$ to 3i , but I think that an adult should have at least a dram to begin with, and this dose repeated if necessary. As a rule, I think, one will find that 3i is sufficient to cause asleep varying in length from one to seven hours. If a dram dose has not the desired effect, I generally order another $\mathfrak{z}\text{ss}$ to 3i to be given in an hour and a half. As both Chloral Hydrate and Bromide of Potass show their physiological action rapidly, an hour and a half is ample time to allow before repeating the dose. I show a chart, illustrative of the cases of enteric, in which I used "Bromidia" on account of "Insomnia".

No. 10 —. aet. 21 years, a case with obscure enteric symptoms, along with some consolidation of the left lung - slight pleural effusion - oegophony - and some suspicion of cardiac disease. Patient was restless for several nights, and on the 19th day of

of illness, had 3i of Bromidia and slept well, during the night. On the 23rd day of illness again she was restless, and in the evening had a temperature of 102.2°F. with wakefulness. A dram of "Bromidia" was given with good result. During the night of the 24th day of illness, she was delirious and slept none. On the following two evenings, she had thirty minims of "Bromidia" in conjunction with Brandy, and she slept well. The pulmonary condition cleared up, and she made an excellent recovery. Children take the combination well, and I had a little boy, as a patient with enteric complicated by a left sided pneumonia, who seemed to sleep well under its influence. At the beginning of his illness, he was very restless, and I ordered him ten minims of Bromidia - and if necessary, the same quantity repeated in an hour. He had ten minims in two evenings, when he did not sleep; and the drug seemed to have a good influence in causing sleep. Patients seem, too, to become very tolerant of "Bromidia", as I found in the case of one of the Belvidere Nurses, who had diphtheria, followed by kidney disease. While the patient was convalescing from the diphtheria with its complications of kidney mischief and partial paralysis of the soft palate, she gradually developed well

well, marked symptoms of enteric fever. She suffered from persistent insomnia, and as the enteric wore on, she was fiercely maniacal in her delirium. At first the insomnia was overcome by small doses of "Bromidia," but latterly, she required three drams within three hours before quietness and sleep were procured. A case in which "Bromidia" failed to have any effect, is one to which I have already referred, as being, in my opinion, a case of "cerebro-spinal" enteric fever, following the classification of Trousseau. The patient simply yelled day and night, and it was important that she should be quieted for the sake of the other patients in the ward, as well as for her own sake. The drug was given to her at first in comparatively small doses, as she was only a girl of fifteen years of age, but these having no effect, she had $\text{℥} \text{iii}$ within four hours, and this without any appreciable sedative not to speak of hypnotic action. Notwithstanding that Bromidia is a patent medicine, and is of high price, still, I think, it holds a considerable place among hypnotics, and that as a rule, one can depend upon it having a speedy and certain action.

Hyoscine:- is a drug, to which more attention is now being given. It is one of the active principles of Hyoscyamus. This drug was brought into notice three years ago by

by, Dr. Mitchell Bruce in an article in the "Practitioner". He says that it is quite different in its action from Hyoscyamine, which he considers a most dangerous drug. The first time I used Hyoscine was in the case of a woman with severe enteric fever and insomnia. She had a $\frac{1}{100}$ th of a grain. This quieted her, but she did not sleep. Now, when the drug was introduced, it was called a "sedative", and to that extent, in this case, its action was apparent, but no sleep was produced. The second patient was not affected at all by a $\frac{1}{100}$ th of a grain. A female patient was admitted to Ward III East (Enteric Ward) Belvidere Hospital, on the 27th of February, 1891, suffering from very high temperature, delirium and insomnia. I ordered a $\frac{1}{45}$ th grain of Hyoscine by the mouth, to be repeated in two hours, if necessary. The first dose quieted her, but she was quite awake. The second dose was given, and after it, the patient slept for four hours. Ferris and Company of London and Bristol have Hyoscine in the form of "Liquor Hyoscine Hydrobrom". This solution, diluted with an equal bulk of distilled water gives $\frac{1}{100}$ th of a grain in each five minims. This solution is exceedingly useful for hypodermic use - especially when one has difficulty in getting a patient to swallow, as in the earlier stages of the delirium of enteric, when the patient will

will, not swallow. He has just the "glimmering" of reason, and is wondering why people - his friends - are compelling him to take things, he does not want to take, and preventing him from free action. Given hypodermically, this small dose of Hyoscin, as a rule, is quite sufficient to cause sleep. The dose hypodermically, is smaller ($\frac{1}{100}$ th grain) than that in the tablets, which I give by the mouth ($\frac{1}{15}$ th grain) - the action is more rapid, and the patient gets the exact dose, whereas when given by the mouth, occasionally some is lost. From the several enteric cases in which I have used Hyoscin, I have been very favourably impressed with its use as a sedative, and I generally find that given in a $\frac{1}{15}$ th grain dose, its action is directly hypnotic - causing a sleep of from four to seven hours. This compares favourably with the records of the effect of Hyoscyamine, within my personal knowledge, and from what I have read in the literature of the subject. One of my colleagues in Belvidere gave a hypodermic injection of Hyoscyamine for sciatica. Immediately there followed tetanic spasms of the lower limbs, for over an hour. In another case in which Hyoscyamine was given, a patient in Delirium Tremens, consciousness was

was, not regained after the injection of Hyoscyamine, and before death, the patient presented the appearance as if he were completely paralysed.

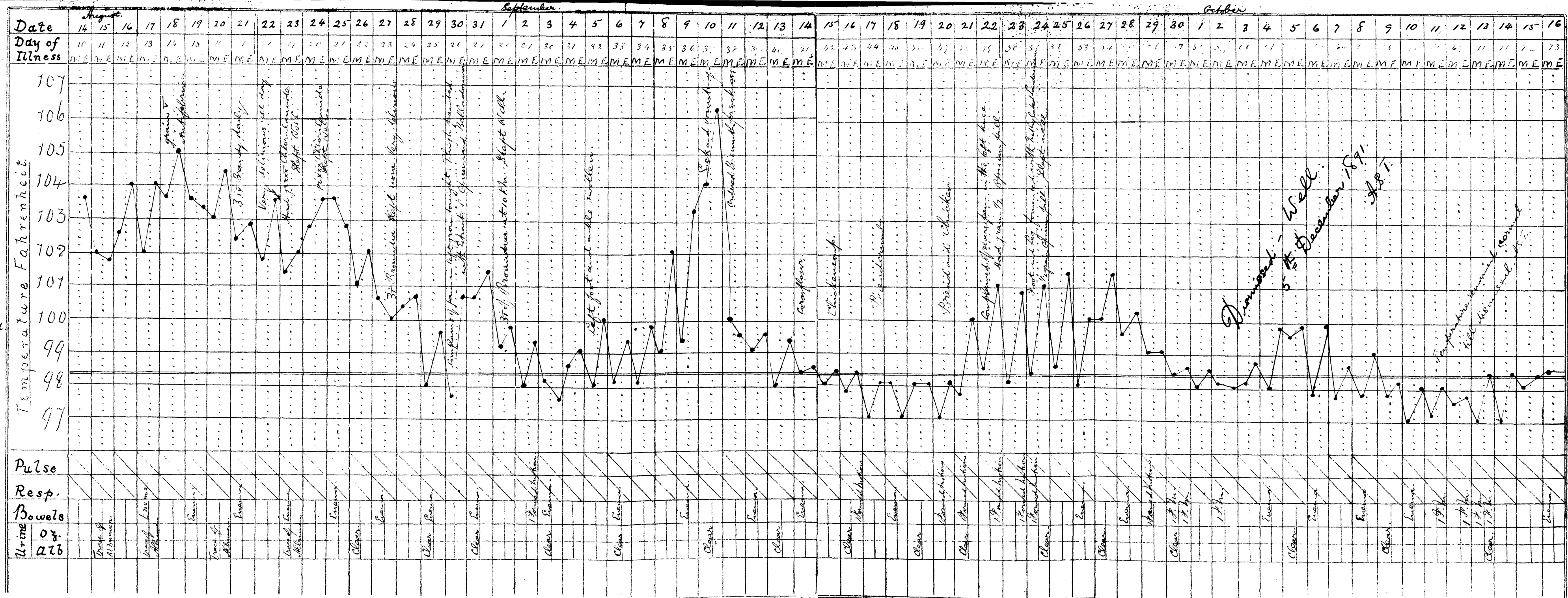
I have never given Hyoscyne where there was the least indication of cardiac disease or failure, as I have noted a distinct fall in the pulse rate after its use. The kind of fever cases in which Hyoscyne should be given, if there be insomnia, are those in the early stages, with a full bounding pulse and clear lungs. In using Hyoscyne, I have followed very much the rules which I have laid down for the use or the contra-indication of the use of Opium.

Chloralamide - is one of the newer hypnotics, which I have tried in several cases of insomnia in enteric fever cases. Its improved combination, Chlorobrom, I have also used on several occasions. Chloralamide is a combination of chemical substances in which Chloral plays an important part, being present to the extent of about 75%. One part of Chloralamide is soluble in from 10 to 15 parts of water, and the dose is generally laid down as being up to forty-five grains. This drug I have been in the habit of prescribing in thirty grain doses. Its effect is generally apparent in

in, about three quarters of an hour to two hours. That is, when thirty grains are given to an adult patient. This dose I found rather to stimulate than depress the pulse, and for this reason, I was not afraid to prescribe the drug in cases where the lungs were involved. It generally, when effectual, produces a sleep varying in length from six to eight hours. There were three cases, in particular, in which I noted carefully the effect of Chloralamide. The first was that of a Ship's Steward aet. 20 years - with severe enteric fever. He was admitted to Hospital about his 12th day of illness, and to all appearances was a very serious case. There was busy delirium - sordes on the lips, and a brown dry tongue - subultrus tendonium - etc. His mother informed the nurse that patient had not slept for a week, before his admission to Hospital. On the first evening, he had grains $\times v$ of Chloralamide, but slept none. On the second evening he had thirty grains, but still was wakeful. The same dose was repeated on the third evening with other thirty grains in two hours - when he slept all night. In this case, the temperature came down by crisis, and patient made an excellent recovery.

In the second case - also that of a man with enteric fever the drug had no effect whatever, and resort had to be

Janet Houston.
aet. 19 years.
Admitted to Ward
v East.
10th August 1891.
Dismissed - Well
5th December 1891.
Case of Enteric
complicated by
"White Leg".
Delirium long continued.
Insomnia treated
with Chloralamide.
Post febrile benumbia.



be, had to give Chloral. The third case was that of I-4- a girl, aet. 19 years. She was an enteric patient, and was admitted to Hospital on the 10th day of her illness. On the 14th day of illness, her temperature went up to 105°F. and she became very delirious and wakeful. She was put on Brandy, and this quieted her; but on the 18th day, the daily report was "Very delirious all day". She had gr. xxx of Chloralamide on that evening, and slept well all night, and on the evening of the 20th day of illness the same dose of the drug was given, and patient slept well. The delirium still continued, and "Bromidia" was inactive in her case. One patient objected to the (bitter) "wersh" taste of Chloralamide, though it gave him a refreshing sleep. On the whole, I am inclined to regard Chloral as a better drug, and swifter in its action than Chloralamide; though in moderate doses, Chloralamide seems to stimulate, rather than depress, and in some cases this would certainly be an advantage.

I was more favourably impressed with "Chlorobrom" a combination of Chloralamide and Bromide than with Chloralamide itself. Chlorobrom is made up with flavouring agents, I think, as I have tried it,

it, personally, and found it pleasant to take. I also found that patients took it without difficulty.

I had my attention drawn to "Chlorobrom" in the summer of 1891, and tried it with fair success in several cases of insomnia. It was ordered to be given in dessertspoonful doses - repeated in a few hours if necessary. A dessertspoonful dose ought to contain Chloralamide $\text{gr} \times \text{v}$ and Bromide about $\text{gr} \times \text{v}$. All the patients I tried it on were women in the enteric and typhus ^{wards}. In the enteric wards, I thought it acted as a good hypnotic, and the nurses found less difficulty in giving it, than Chloral, Paraldehyde or Bromides. The only time I saw any trouble with it, was when it was given in a case of peritonitis with severe vomiting, and insomnia consequently. It was given in the hope of being retained, as Opium was contraindicated owing to lung and kidney complications, but it was rejected very quickly. In the typhus ward, I tried "Chlorobrom" for some time, but was inclined to continue Chloral, which in typhus acts so satisfactorily and so sweetly, if given in the manner indicated. During the period of my charge of the female typhus ward, one of my nurses had a very sharp attack of typhus.

She was very watchful and suspicious, and it was with difficulty that she was induced to take food. "Chlorobrom" was ordered in 3j doses - divided into two doses, and acted perfectly on several occasions when sleep was indicated. I have not tried Chlorobrom as yet in ordinary Medical cases - but think it would answer admirably in cases of insomnia from overwork or worry, and I think "Chlorobrom" an improvement on Chloralamide for the treatment of insomnia in fevers, but have not had so large experience of those drugs, as the ones on which I have written at more length.

As regards the insomnia of convalescence from fever, I think that the attention should always be directed to the temperature of the body. In cases where there has been a prolonged illness, during the convalescence the temperature is often subnormal, and the more is this the case when the emaciation has been very great. In such cases the patient is sometimes kept awake simply from cold extremities. Others again on the evening visit have a very quick weak pulse. In this class of cases, a little hot Brandy or Whiskey acts well, and if five minims of Tincture of Digitalis be

be, added where the pulse is weak and rapid the combination acts like a charm, and produces a good sound sleep. The Digitalis gives tone to the vessels and in this way the circulation of the brain becomes restored. An anaemia of the brain is produced, and there is probably a corresponding dilatation of the capillaries of the surface of the body. A case in which the value of the combination of Brandy and Digitalis was demonstrated to me was that of a case of enteric - greatly protracted by a low form of pneumonia i.e. where there had been passive hyperaemia, and where this had gone on to consolidation. During convalescence the patient was very thin, and occasionally she suffered from insomnia. Brandy and Digitalis always had the effect of giving a refreshing sleep, lasting several hours. At the commencement of this paper, I have said that I thought the subject of the treatment of insomnia was often associated with that of the treatment of hyperpyrexia. In no class of cases is this more seen, than in severe cases of scarlet fever. In plethoric subjects with a bad dusky rash, and severe throat affections, the temperature in an early stage of the illness often reaches to an alarming height.

In this class of patients, one almost invariably meets with insomnia. I had many cases of this kind under my care during the scarlet fever epidemic in Glasgow - during the winter 1890-91. In the earlier part of the epidemic, the cases were very mild, but later on, the cases frequently presented grave symptoms - such as dark, mealy, indistinct or "dark blue" rashes, or bad throat and neck complications with delirium and insomnia. As instancing the difference in the type of cases before and during the epidemic, I may state that in one children's ward, in six months, there were only two deaths, though the ward always had 24 to 30 patients, and in the same ward, in the succeeding seven months, there were thirty deaths, thus strikingly showing the difference in severity of the types of scarlet fever in these thirteen months. The cases with hyperpyrexia, almost without exception, had insomnia, many with active delirium. Several methods of treatment were adopted in such cases.

The Cold wet Pack:- in many cases had a wonderful effect on the temperature, pulling it down often from one to four degrees.

During the giving of cold wet packs in my wards, I observed the following rules (1) Only when the temperature was above 105°F , did I use such packs. Cases with lower temperatures, say from 104°F to 105°F , were dealt with in less severe methods, but often with none the less effective results. (2) The lungs had to be clear and the heart and pulse strong. (3) I always stood by the patient, watching the pulse and face during the giving of the pack. (4) The pack was generally given from thirty to sixty minutes, the patient being removed on signs of syncope or sickness coming on. In several cases thus treated, the effect on the temperature was often very marked and lasting.

What I want to emphasize about the cold pack, is this - that the temperature being pulled down the circulation was controlled, and the vessels of the brain seemed to participate in the general vascular contraction. This caused sleep by the subsequent cerebral anaemia. I have more than once seen a child fall asleep in a cold wet pack, and this sleep lasting for several hours after the child had

had, been put to bed. The hyperpyrexia and insomnia may be overcome by the cold pack, and I recorded a case where the patient ultimately recovered, when his temperature was between 106°F and 107°F . Sometimes though a case ultimately is fatal in its issue, with a very high temperature, yet I incline to the opinion that the repeated judicious use of cold packs often prolongs life.

In cases where the temperature is high in scarlet, say from 104°F to 105°F . - with sleeplessness and with dry skin, often sleep is procured, sweating produced, and a fall in temperature obtained when the patient is repeatedly sponged with mustard and hot water. This method may be adopted in hyperpyretic cases with insomnia when the cold wet pack is contra-indicated. I mean in cases where there is perhaps a weak and rapid heart, and perhaps some pulmonary congestion. This method, however, as a sedative and antipyretic, has not the power and value of the cold wet pack. The temperature, as a rule falls, when a case is sponged with mustard and water, but it is much more apt to rise in an hour or two than it is,

is, when the cold wet pack is employed.

Another antipyretic and sedative measure, and often a very grateful one with restless enteric cases is the sponging of the limbs and head with tepid water and acetic acid (four parts of water to one of acid). This produces a pleasant coolness, and as hospital patients express it, they often ask to be "washed." The advantage of the "Mustard" and "Acetic" spongings is, that they can be repeated in a much shorter interval than the cold wet pack possibly can be.

I have tried to show that in my opinion there is a connection between hyperpyrexia and insomnia, and I further think that there is a connection between sleep and a lowering of the body temperature.

Sleep is a natural antipyretic, that is during sleep the body temperature is below that of the waking hours.

Now when a good sound sleep is procured by a hypnotic in a fever case, besides strengthening the patient, I think that the temperature is often lowered. I have

several times, especially during the course of an enteric fever case, been impressed with this. For instance, say in the second week there is insomnia and high pyrexia. A hypnotic is ordered.

In the morning after, if the patient has slept, the temperature is lower than one would expect from the height of the previous evening one, and it is distinctly out of the usual "morning-evening" ratio. I cannot support my statement, that this is a definite fact as regards the lowering of body temperatures after the use of hypnotics in fever cases, by quoting from any standard ~~author~~, but still I am strongly inclined to believe that it is a fact.

Chloral and Opium have both been set down as having an antipyretic action, but as regards the effect of the other hypnotics as antipyretics, I have not seen anything on that point in the literature of the subject. My opinion on these points can only be confirmed or altered as my experience of these drugs increases.

The foregoing notes contain my experience of the use of hypnotics in fevers, and they have, for the most part, been gathered from my own clinical observations.

I am aware that there are several of the newer hypnotic drugs, of which I have taken no notice in these pages, but the reason of this is, that I have had no personal experience of them.

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